

Date: Friday, 29/05/2009 3:37:22 PM  
 User: Julie Dawson

## Process Sheet

Customer : CU-DAR001 Dart Helicopters Services Drawing Name : 407 HIGH AFT X-TUBE ASSEMBLY  
 Job Number : 48291  
 Estimate Number : 10528  
 P.O. Number :  
 This Issue : 29/05/2009 S.O. No. :  
 Prsht Rev. : NC Part Number : D407667205  
 First Issue : 1/1 Type : CROSSTUBES Drawing Number : D407-667-245 REV F  
 Previous Run : 47779 Drawing Revision : F  
 Material :  
 Due Date : 11/06/2009 Qty: 1 Um: Each

Written By :  
 Checked & Approved By : JULIE DAWSON  
 Comment : Est Rev:C 05.09.02 Add holes for compatibility with Bell  
 Skidtubes KJ/JLM  
 Est Rev:D Added Magnobond, Rubber Cushion & Clamps  
 07-02-19 JLM

\*\*\*\*CHANGE TO CHG 005 - IF USING D2894-1 B35578 OR  
 GREATER\*\*\*\*

Est Rev:E 08-05-22 add comment in seq. 6 and QC15 and  
 QC5 DD verified by:EC  
 Est Rev:F 08-06-12 add comment in seq. 24 DD verified  
 by:EC  
 Est Rev:G 08-08-19 revE as per dwg DD verified by:EC  
 Est Rev H 09.01.06 ECN 08-562 EC verified by:DD

## Additional Product

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 DC DOCUMENT CONTROL



Handwritten: HJ Fac CL 09/06/18



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D407-667-205 CHG006

Handwritten: S 09/06/18

2.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

3.0 D407667205TRN Crosstube Turning Detail



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

CROSSTUBE TURNING DETAIL

batch B4789.3

Handwritten: DP

Handwritten: 9-6-8

4.0 BENDING BENDING MACHINE - SKIDTUBES



Comment: LANDING GEAR RESOURCE 1

1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio FT

Handwritten: DP 9-6-8

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0 QC15

DIMENSIONAL CHECK OF X-TUBES



Comment: DIMENSIONAL CHECK OF X-TUBES

S 09/06/09 (X)

6.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

- 1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes.
- 2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245 Check dimensions between holes on all four sides.
- 3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.
- 4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes.
- 5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245
- 6-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Note: Aft side has 3x top holes.
- 7-Drill Fwd rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Drill only the top (3) holes.
- 8-C'sink holes as per Dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.
- 9-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D407-667-245
- 10- Scribe tube to identify on the inner chamfer in the cuff D# and B#

09-06-09 (X)

9-6-9 Avn

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



AWM 9-L-10



(1)

Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

8.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

S 09/06/10 (X)

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Job Number: 48291

Part Number: D407667205

Job Number:



Seq. #:

Machine Or Operation:

Description :

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

09/06/10 (4)

10.0

OUTSIDE SERVICE

OUTSIDE SERVICES-ENGINEERING



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 038Or

Issue P/O: 8959 LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

0209/06/11 (1)

11.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

09/06/11 (1)

12.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

ml 09 06 15

(1)

13.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: 8:45

Finish Time: 9:10

PAINT:

Start Time: 3:15

Finish Time: 4:20

ml 09 06 16 (1)

14.0

QC14

INSPECT SPRAY PAINT



Comment: Inspect Spray Paint

Wrap in plastic bag to protect from scratches

09/06/10 (4)

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Job Number:



Seq. #: Machine Or Operation: Description :

15.0 D2856400 Abrasion Strip



Comment: Qty.: 1.3524 f(s)/Unit Total : 1.3524 f(s)

Pick:

Qty Part number Description Batch 42437  
2 D2856-400(Cut to 7.73") Abrasion Strip ~~42437~~

ml 09 06 18

16.0 D2873043 Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch  
2 D2873-043 Nut Plate 45369

ml 09 06 18

17.0 D2873045 Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch  
2 D2873-045 Nut Plate 44038

ml 09 06 18

18.0 D28941 2.750 Support



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part number Description Batch  
1 D2894-1 Support 43713

ml 09-06-17

19.0 D31901 Chafing Shield



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch  
2 D3190-1 Chafing Shield 40109

ml 09 06 18

20.0 D3595063430 rubber cushion



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Rubber Cushion .63" X 4.30"

Batch: 43210

ml 09-06-17

W/O:		WORK ORDER CHANGES					
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Job Number:



Seq. #:

Machine Or Operation:

Description :

21.0

MS20601AD4W8

RIVET



Comment: Qty.: 14.0000 Each(s)/Unit Total : 14.0000 Each(s)

Pick:

Qty Part number Description Batch

14 MS20601AD4W8 Rivet 1103AA

ml 09 06 18

22.0

MS2192022

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number Description Batch

4 MS21920-22 Clamp 1094A5

ml 09 06 18

23.0

MS2192025

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Clamp(per MIL-DTL-8783C)

Batch: 111883

ml 09 06 17

24.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install abrasion strips as per QSI 035 using DT8674. Install chafing shield as per Dwg D407-667-245. Note:  
(3) top holes should be facing up.

2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

ml 09 06 18 (1)

3-Install support with magnobond and install clamps as per Dwg D407-667-245 using installation jig DT9025.

4- Torque clamps to 80-100 in lb

A/R Magnobond

Batch: 111249

EXP: 02/2010

ml 09-06-17 (1)

4-Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint.

ml 09 06 18 (1)

25.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

09/06/18 (1)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Part Number: D407667205

Job Number:



Seq. #: Machine Or Operation: Description :

26.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1  
Pick Packing Kit

27.0

AN534A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  
Bolt  
Batch: M109752

9/6/18  
①

M111425

SL

28.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  
Nut  
Batch: M111127

9/6/18

SL

29.0

AN510A

Bolt



Comment: Qty.: 10.0000 Each(s)/Unit Total : 10.0000 Each(s)  
Pick:Packing Kit  
Qty Part number Description Batch  
10 AN5-10A Bolt M111425

9/6/18

SL

30.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  
Pick:Packing Kit  
Qty Part number Description Batch  
4 AN5-32A Bolt M111425

9/6/18

SL

31.0

AN960JD516

Washer



Comment: Qty.: 18.0000 Each(s)/Unit Total : 18.0000 Each(s)  
Pick:Packing Kit  
Qty Part number Description Batch  
18 AN960JD516 Washer M111279

9/6/18

SL

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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Job Number: 48291

Part Number: D407667205

Job Number:



Seq. #:

Machine Or Operation:

Description :

32.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

8 09/06/18 (40)

33.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and in kanban rack

Location: 53

E 9/4/19

(12)

54

34.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

09/06/22 (1)

Job Completion



12 09-06-19

B48291 D407-667-205

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

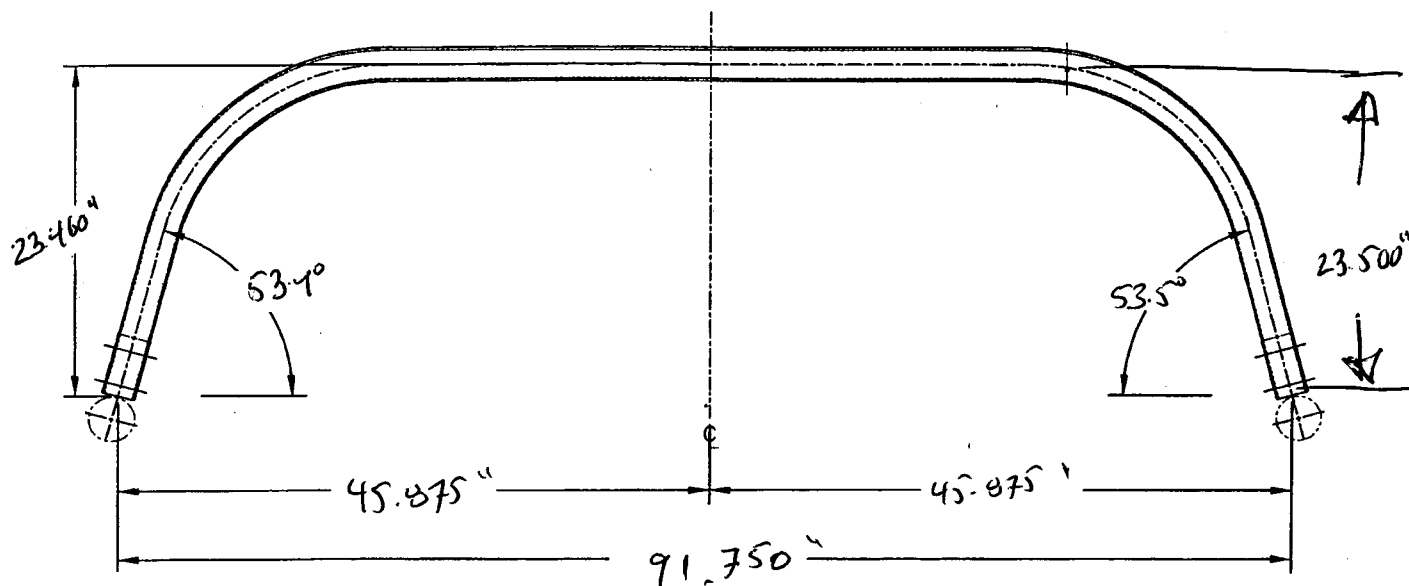
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**NOTE:** Date & initial all entries

DART AEROSPACE LTD		Work Order:	48291
Description: Crosstube High Aft (407)		Part Number:	D407-667-205
Inspection Dwg: D407-667-245		Rev: <i>DF</i>	Page 1 of 1

Required Dimension	Min	Max
Height	23.46	23.58
1/2 Span	45.86	45.98
Angle	54	56
Total Span	91.72	91.96



Comments
tube is slightly off on height. but well with in tol's.

QC15 Inspection	<i>S</i>
Date	09/06/07

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM <i>df</i>	<i>[Signature]</i>

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION R80-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

#### GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6011-115  
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.  
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS. EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 14) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, PER QSI 035.
- 15) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.  
TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED  
08/11/06

F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 8 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C8-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECR#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	90		
DRAWN	RF		
CHECKED	90		
MFG. APPR.	90		
APPROVED	90		
DE APPR.	90		
DATE	08.11.06		
<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA DRAWING NO. D407-667-245 TITLE CROSSTUBE ASS'Y (407 HIGH AFT) SCALE NTS SHEET 1 OF 4 COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

NO. 178201  
WORK ORDER  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
INTERIOR  
ROLLID COPY  
OF COPY

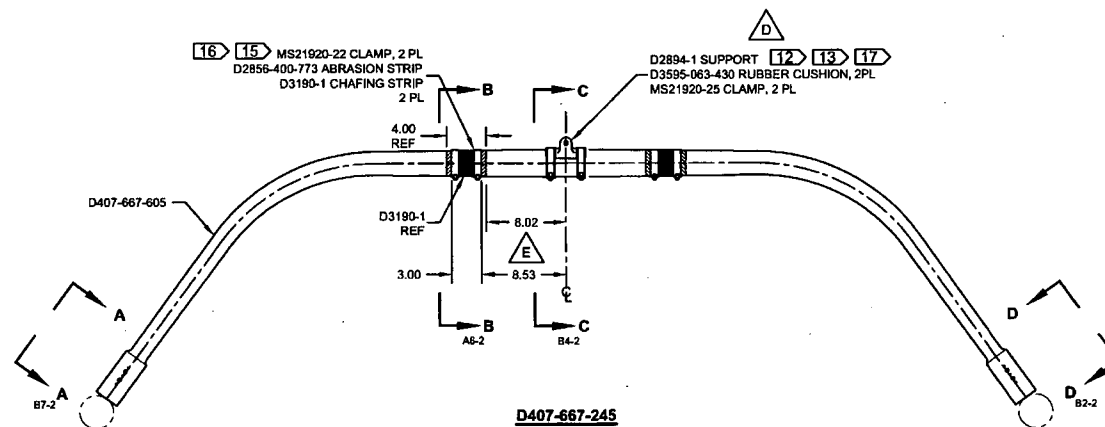
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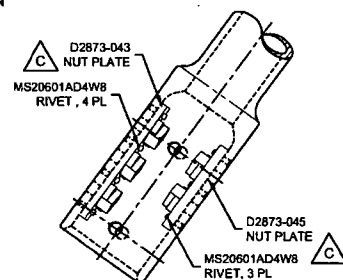
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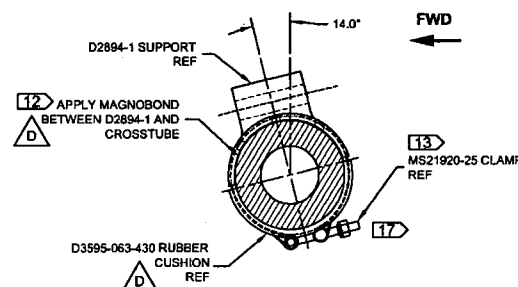
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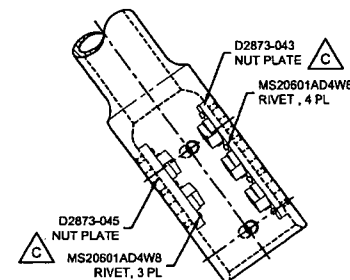
**D407-667-245**  
**ASSEMBLY DETAIL**  
(VIEW LOOKING FWD)



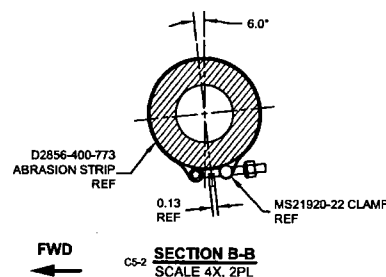
C7-2 **VIEW A-A CUFF DETAIL**  
SCALE 4X



C4-2 **SECTION C-C**  
SCALE 4X



C2-2 **VIEW D-D CUFF DETAIL**  
SCALE 4X



C5-2 **SECTION B-B**  
SCALE 4X, 2PL

**RELEASED**  
08/11/06

DESIGN	90	<b>DART AEROSPACE LTD</b>	
DRAWN	RE	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RE	DRAWING NO.	REV. F
MFG. APPR.	RE	D407-667-245	SHEET 2 OF 4
APPROVED	RE	TITLE	SCALE
DE APPR.	RE	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	<small>COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMBINED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

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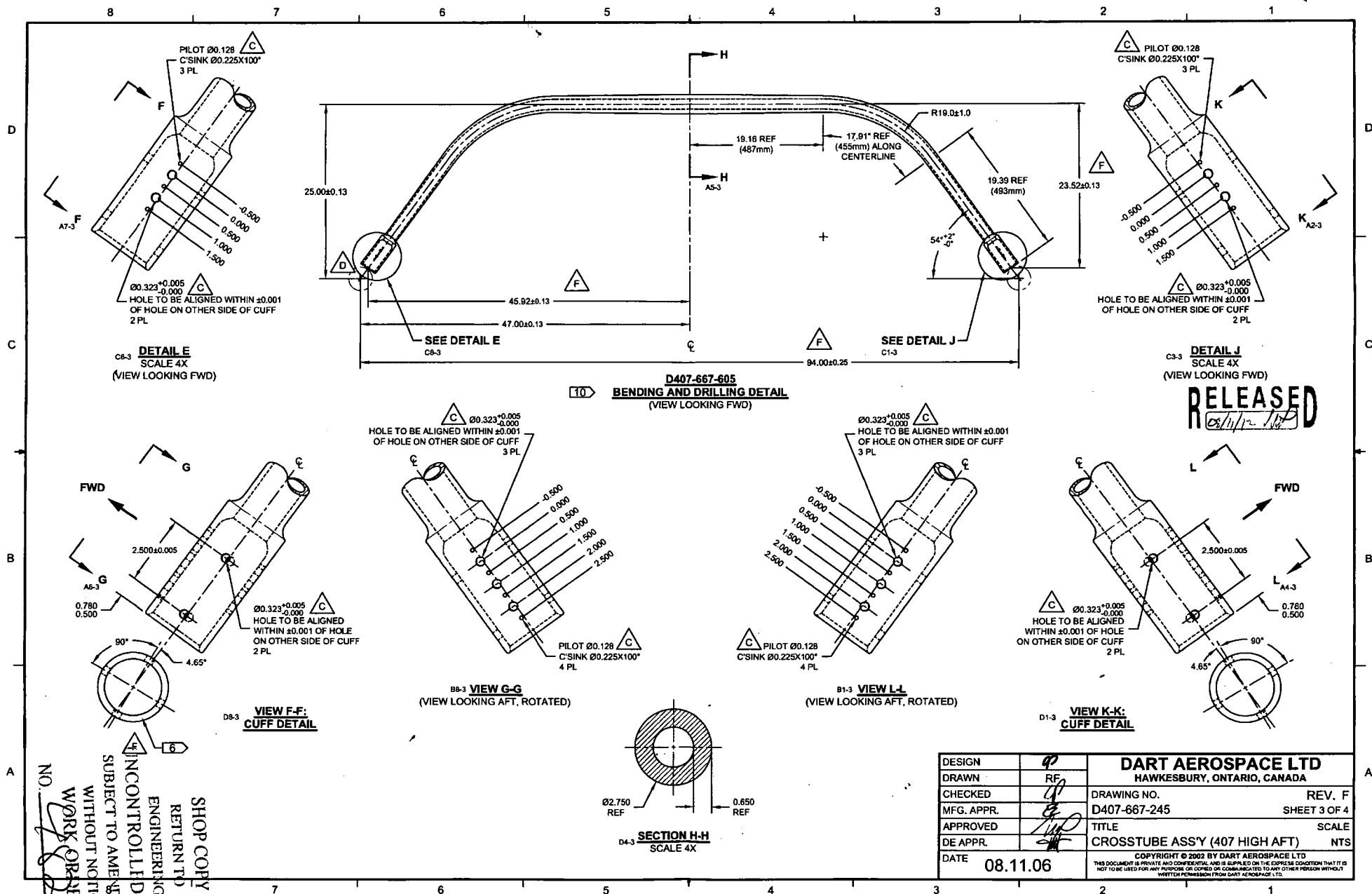
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

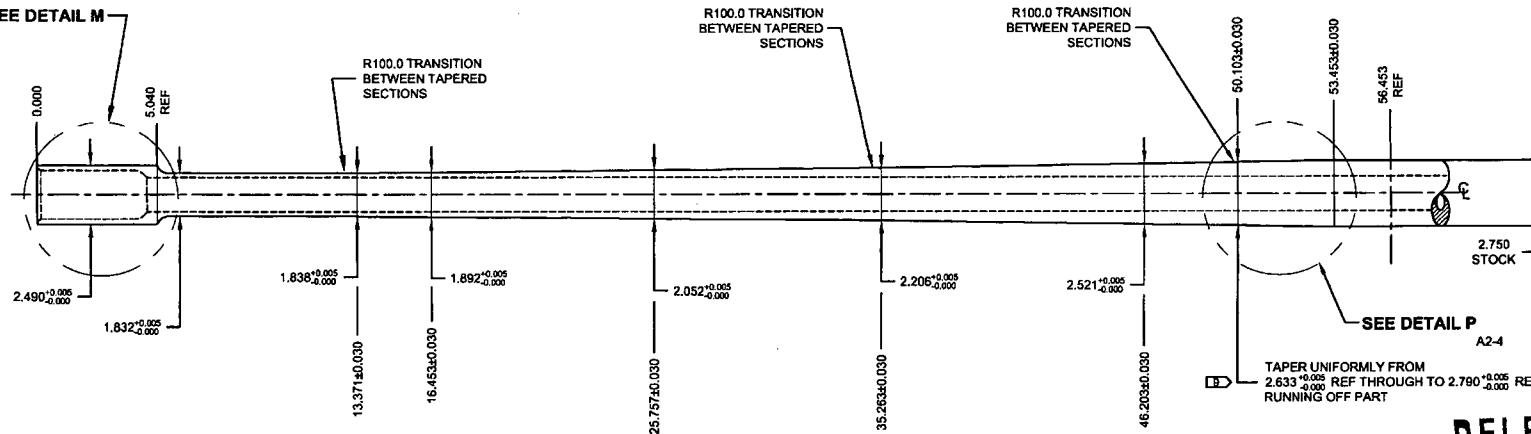
Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

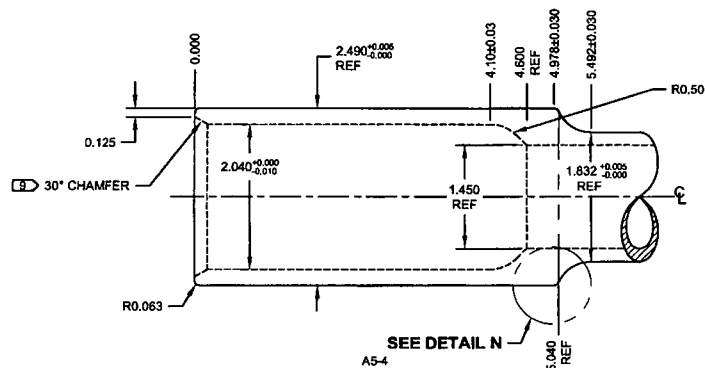
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

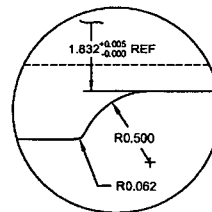
SEE DETAIL M  
A7-4



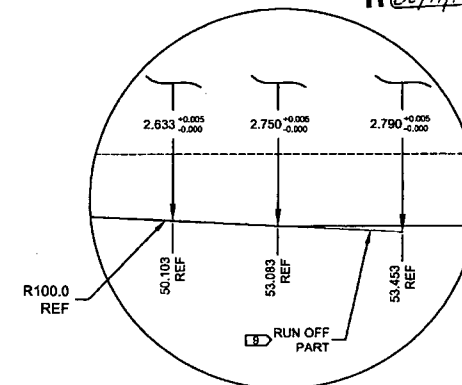
**D407-667-245 MACHINING DETAIL**



**DETAIL M: CROSSTUBE CUFF**  
SCALE 3X



**DETAIL N: CUFF TRANSITION**  
SCALE 2X



**DETAIL P: TAPER RUN-OFF**  
NOT TO SCALE

RELEASED  
08/11/12 J117

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MFG. APPR.	90	D407-667-245	SHEET 4 OF 4
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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries





# LIQUID PENETRANT TEST REPORT

P- 14941

CLIENT	<u>DART AEROSPACE</u>	DATE	<u>JUNE 11-2009</u>	PAGE	<u>1</u>	OF	<u>1</u>
ATTENTION	<u>LINDA/CHANTEL</u>	ACUREN JOB NO.	<u>108-02-1457</u>	TIME	AM <input checked="" type="checkbox"/>	PM <input type="checkbox"/>	
ADDRESS	<u>1270 ASERDEN ST.</u>	PO/NO.	<u>8959</u>				
	<u>HAWKSBURY ON. KGH 1K7</u>	WORK LOCATION	<u>SHO.P</u>				
		ACCEPTANCE STD.	<u>ASTM 1417</u>	REV./DATE	<u>2007</u>		
PROJECT	<u>F.P.I. ON CROSS TUBES.</u>						
ITEM(S) EXAMINED	<u>5 PCS</u>						

JOB DESCRIPTION	PROCEDURE NO. LT-XXXX	REV./DATE	TECHNIQUE NO. LT-XXXX-XXX	REV./DATE
PART NO.			MATERIAL <u>ALUMINUM</u>	THICKNESS <u>—</u>
SCOPE	<u>WET FLOUORESCENT LIQUID PENETRANT INSPECTION</u>			

TEST DETAILS					
METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND	<u>MAGNA FLUX</u>		BLACK LIGHT S/N	<input type="checkbox"/> OUTPUT > 1000 $\mu$ W/cm <sup>2</sup>	<input type="checkbox"/> AMBIENT < 2 fc
PENETRANT	<u>2LG7</u>	MINIMUM DWELL TIME <u>45</u> MIN.	LIGHTING EQUIP.	<input type="checkbox"/> FLASHLIGHT	<input type="checkbox"/> TROUBLELIGHT
PENETRANT REMOVER	<u>H2O</u>	MINIMUM DRY TIME <u>&gt;10</u> MIN.	OTHER	<input type="checkbox"/> OUTPUT > 100 fc @ SURFACE	
DEVELOPER	<u>SKD 502</u>	MINIMUM DWELL TIME <u>10</u> MIN.	LIGHT METER S/N		CAL DUE DATE
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY		

TEST SURFACE					
SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < - 4°C/ 20°F	<input type="checkbox"/> - 4°C/ 20°F TO 10°C/50°F	<input type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

RESULTS- ( <input type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL )	COMMENTS	ACCEPT	REJECT
	<u>JCS #</u>		
	<u>1- 48297</u>	<input checked="" type="checkbox"/>	
	<u>1- 48291</u>	<input checked="" type="checkbox"/>	
	<u>1- 48292</u>	<input checked="" type="checkbox"/>	
	<u>1- 48290</u>	<input checked="" type="checkbox"/>	
	<u>1- 48289</u>	<input checked="" type="checkbox"/>	
	<u>1- 48392</u>	<input checked="" type="checkbox"/>	
	<u>1- 48391</u>	<input checked="" type="checkbox"/>	

Scope of Services  
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.  
Standard of Care  
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES			
CLIENT REPRESENTATIVE	<u>MATTHEW MURDOCH</u>	DTR #	
TECHNICIAN (SIGNATURE):	<u>MIKE JEFFERSON</u>	REPORT REVIEWED BY:	
NAME (PRINT):	<u>MIKE JEFFERSON</u>	NAME	INITIALS
CGSB LEVEL <u>II</u>	SNT LEVEL	CGSB LEVEL	SNT LEVEL
CGSB REG. NO. <u>6066</u>		CGSB REG. NO.	

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